CHAPTER III
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RESEARCH METHODOLOGY

3. RESEARCH METHODOLOGY

A research methodology defines what the activity of research is, how to proceed, how to measure progress, and what constitutes success. The methodological decision paves crucial implications for validity and credibility of the study findings. The methodology of research indicates the general pattern for organizing the procedure for the empirical study together with the method of obtaining valid and reliable data for an investigation.  

This chapter deals with the methodology adopted for assessing the immunization practices of parent and health personnel. It includes the description of the research approach, research design, setting of the study, sample and sampling technique, development of data collection tools & questionnaire, procedure for data collection and the plan for data analysis.

3.1 Research approach

The research approach is plan and procedure for research, that span the steps from broad assumption to detailed methods of data collection, analysis and interpretation.

The explorative descriptive approach is use for this study. In this study design, the investigator will find immunization practices in urban and rural population of Pune city.

3.2 Research design

The research design is the plan, structure & strategy of investigation of answering the research questions is the overall plan.

The research design is cross-sectional & comparative survey design to assess immunization practices in urban and rural population of Pune city.
Assess and develop information booklet on immunization practices among parents and health personnel from selected urban versus rural areas.

FIG NO. 2: SCHEMATIC PRESENTATION OF RESEARCH METHODOLOGY

RESEARCH DESIGN
Comparative cross-sectional survey research design

TARGET POPULATION:
Parents of under five age child and health personnel.

ACCESSIBLE POPULATION:
Parents of under five age child & health personnel involved in immunization of urban and rural areas of Pune

SAMPLING TECHNIQUE: Multistage cluster sampling technique.
SAMPLE SIZE: 800 parents and 200 health personnel.

SETTING:
Five Taluakas of Pune district based on regions
Khed, Velhe, Haveli, Daund, Mulsi

TOOL: structured interview schedule and observation checklist.
Tool Finalized after content validity and test retest, inter-rater reliability

PILOT STUDY: 80 parents & 20 health personnel. Study is feasible & practicable.

DATA COLLECTION

Fig no. 2: Schematic presentation of Research Methodology
Assess and develop information booklet on immunization practices among parents and health personnel from selected urban versus rural areas.

3.3 Setting of the study

Setting refers to the areas where the study is conducted. The settings for this study are the selected area in urban & rural population from Pune city.

Pune district is a district in state of Maharashtra in India. There are 14 talukas in Pune district. The 14 taluka are divided into following 5 district subdivisions as east, west, central, south and north. The selected area are from each subdivision Khed, Velhe, Haveli, Daund and Mulshi.

![Map of Pune city](image)

**Fig no.3 Map of Pune city**

3.4 Population

Population is a complete set of persons or objects that possess some common characteristic that is of interest to the researcher. The population for a study usually is described as being composed of two groups-the target population and the accessible population. The target population, which is also called the universe, is composed of the entire group of people or objects to which the researcher wishes to generalize the findings.
of a study. The target population consists of people or things that meet the designed set of criteria of interest to the researcher.\textsuperscript{44}

The population of the present study comprises parents of under 5 age child and health personnel.

### 3.5 Sample

Sample is defined as a small portion of the population selected to participate in the research study.\textsuperscript{44} As per provisional reports of Census India, population of Pune in 2011 is 3,115,431 of which children (0-6) in Pune city are 324,572 as per figure from Census India report on 2011.\textsuperscript{5}

In this study samples are parents of under 5 age child and health personnel in selected areas of Pune city.

### 3.6 Sample size

Sample size refers to the number of sample elements from which data is collected in order to evaluate the statistical significance of findings. The size of the sample depends on a number of factors, including the previous study data.\textsuperscript{44}

The estimated sample size for the parents is determined largely by three factors:

i. The estimated prevalence (P) of variable – for the study survey was done by National Rural Health Mission across 15 states, in which immunization coverage of Maharashtra is 71% .\textsuperscript{32}

ii. The desired level of confidence – for this study taken as 95%.

iii. Absolute precision / acceptable error (E) 01%

Sample size determination $(n) = \frac{Z_{1-\alpha/2}^2 \times p \times q}{d^2}$

$$n = (1.96)^2 \times 0.71 \times 0.31 \div (0.01)^2$$

$$n = 806$$

Therefore the sample size for parents was taken as 800 who fulfilled the criteria.
Assess and develop information booklet on immunization practices among parents and health personnel from selected urban versus rural areas.

The estimated sample size for the parents is determined largely by three factors:

i. The estimated prevalence (P) of variable – for the study was done on Evaluation of immunization knowledge, practices, and service delivery in the private sector. The private sector demonstrated about 10% of lack of quality of care and management in terms of health workers’ knowledge of immunization schedules, waste and vaccine management practices, and exchange of health information with the public sector.\textsuperscript{12}

ii. The desired level of confidence – for this study taken as 95%.

iii. Absolute precision / acceptable error (E) 04%

Sample size determination \( (n) = \frac{Z^{2} \cdot p \cdot q}{d^{2}} \)

\[ n = (1.96)^{2} \times 0.1 \times 0.9 \div (0.01)^{2} \]

\[ n = 176 \]

Therefore the sample size for health personnel was taken as 200 who fulfilled the criteria.

3.7 Sampling technique

Cluster random sampling is defined as the usual procedure for selecting samples from a general population is to sample successive stages in cluster sampling this approach is often called as multistage sampling.\textsuperscript{44}

Probability, multistage sampling technique will be used for selecting samples who met the designated set of criteria during the period of data collection.

First stage -The 14 taluka’s of Pune are subdivided as east, west, central, south and north. With help of blind fold method randomly selected talukas from each subdivision are Daund, Mulshi, Haveli, Khed, Velhe.

Second stage -For health personnel randomly selected urban and rural area’s PHC and attached Subcentre (SC). For parents randomly selected urban and rural area.

Third stage – Health personnel were randomly selected from PHC and SC. Parents were also selected randomly as every 4\textsuperscript{th} house was taken as sample and if there is no under-five age child the next house was taken as sample.
Assess and develop information booklet on immunization practices among parents and health personnel from selected urban versus rural areas.

**Fig no.4 Schematic Representation of Sampling Process**

### 3.8 Sampling Criteria

The following criteria were set for the selection of sample:

**Inclusion Criteria**

- Parents who are having under-five children.
- Parents and health care personnel who were able to understand & speak Marathi, Hindi and English.
- Parents who were living in selected urban and rural areas of Pune.
- Health care personnel involved in vaccination & working in selected urban and rural areas of Pune.

**Exclusion Criteria**

- Parents who were not willing to participate in this study.
- Health care personnel who were not willing to participate in this study.
Assess and develop information booklet on immunization practices among parents and health personnel from selected urban versus rural areas.

3.9 Data collection technique and tool

A tool is a method, technique, instrument, device or a form designed to guide the observations, to collect, assess or record and measure the collected data in a systematic and uniform manner. A tool is selected appropriately in a given situation, depending on the research approach, sample size, laid down criteria etc. The phenomena in which a researcher is interested must ultimately be translated into data that can be analyzed. The task of defining the research variable and selecting or developing appropriate methods for collecting data are amongst the most challenging work in hand of a researcher. With high quality data collection methods, the accuracy and robustness of the conclusions are always subject to challenge. The most important and crucial aspect of any research is data collection, which provides answers to the questions under study. Data collection relies on instruments.

Various techniques of data gathering involves the use of appropriate recording forms. These are called tools or instruments of data collection. Data collection techniques are described as being both objective and systematic. Here objective means that data must not be influenced by anyone who collects the data. Whereas systematic means that data must be collected in the same way by everyone who is involved in data collection process.\(^\text{141}\)

The present study aimed at assessing the immunization practices in urban and rural population of Pune city. Structure interview technique and observation checklist is used for data collection.

3.10 Development of tool

Although we are all accustomed to asking questions, the proper phrasing of questions in a research study is a delicate task. Structure interview schedule & observation check list will be developed for assessing the immunization practices. In this study, the observation check list and questionnaire will be worded in a manner that could minimize the risk of response biases, enhance clarity and unambiguity, and be courteous to the needs and rights of respondents especially when assessing of highly private nature.
• Review of literature & non research literature used in area of immunization.
• Opinion & suggestions will be taken from experts, which helped in determining the importance.

3.11 Description of the tool

The researcher prepared two separate tools for parent and health personnel.

Tool for health personnel is based on three sections

Section A: This section included four items on demographic profile.

Section B: Comprised of items on basic information regarding immunization.

(45 - 37 : Excellent Knowledge, 36 - 28 : Very good, 27 - 19 : Good,
18 -10 : Satisfactory, 9 - 0 : Not satisfactory)

Section C: It comprises of observation checklist on the immunization practices.

(30-26 : Excellent Practice, 25-21: Very good, 20-16: Good, 15-11: Satisfactory,
10-0: Not satisfactory)

Tool for Parent is based on three sections

Section A: This section included ten items on demographic profile.

Section B: Comprised of items on basic information regarding immunization.

(7-10 : Good, 4-6 :Average, 0-3 : Poor)

Section C: It comprises of reported practices checklist on the immunization.

(Fully immunized, Partially immunized and Not immunized)

3.12 Validity

Validity refers to getting results that accurately reflect the concept being measured. A valid measure refers to the degree to which an instrument measures what it is supposed to be measuring. In practice, validity can also refer to the success of the research in retrieving "valid" results.

Content validity refers to the degree to which the test actually measures or is specifically related to the traits for which it was designed. Identifying the universe of
content is not an easy task. It is, therefore, usually suggested that a panel of experts in the field to be studied be used to identify a content area.44

The content of data collection tool was sent for its validity in terms of relevance and accuracy to a list of expert along with scoring sheet. The data collection tool was sent to 30 experts out of whom 25 were received back with their valuable suggestion and comments on the study tool.

The content validity of the tool enclosed, self-structured questionnaire with two sections pertaining questions on assessing the demographic information, knowledge and practices assessment regarding immunization.

The validity was established by experts from different departments i.e. Child health Nursing, pediatricians, Sociologist, Community health nursing, Preventive and Social Medicine and. The experts were selected based on their clinical expertise, experience and interest in the problem being studied. They were requested to give their opinions on the appropriateness and relevance of the items in the tool. As a whole the suggestions and comments of experts included grammatical corrections of the sentences. The tool was found to be relevant. The necessary modification has been done as per the expert's advice. After validation of content, an expert in Marathi language translated the tool from English to Marathi.

3.13 Reliability

Reliability has to do with the quality of measurement. In its everyday sense, reliability is the "consistency" or "repeatability" of measures. Reliability is the consistency of a set of measurements or measuring instrument. Reliability does not imply validity. That is, a reliable measure might be measuring something consistently, but it needs not necessarily be what it is supposed to be measuring. Reliability is the extent to which the measurements of a test remain consistent over repeated tests of the same subject under identical conditions.44
After establishing the validity of the tool to be used for the study, the final tool was made and then the reliability of the tool was checked. The reliability of a measuring instrument is a major criterion for assessing its quality and adequacy.\(^ {44} \)

After obtaining formal administrative permission from Urban Health Centre, Landewadi, Pune and Rural Health Centre, Aalandi the tool was administered to 80 parents and 20 health personnel with consent on 10/10/12 to 20/03/13 following Test-retest used for Basic knowledge and Inter-rator reliability for practices.

The purpose was to determine the internal consistency of items, difficulty in understanding items and to ensure the reliability and feasibility of the tool. The test-retest reliability method is one of the simplest ways of testing the stability and reliability of an instrument over time.

Test retest method used and whole data was divided into two equal halves X and Y and using co-efficient of correlation was calculated. The r value was calculated using formula Correlation(r) = \[
\frac{N \Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{[N \Sigma X^2 - (\Sigma X)^2][N \Sigma Y^2 - (\Sigma Y)^2]}}\]
result was found to be 0.84 for parent’s knowledge and 0.97 for Health personnel’s knowledge.

Inter-rator Reliability used for practices in parent and health personnel. In this independent observation was done by two experts. This is used to compute index of equivalence or agreement between two observers. Cohen's Kappa coefficient was used. The result was found to be 0.84 for parents and 0.88 for health personnel.

Hence, the questionnaire was found to be reliable 80% as value is more than 0.8.

### 3.15 Pilot study

A pilot study is a small-scale version or trial run of the major study. The function of the study is to obtain information and assess feasibility of the study for improving and to decide the plan for data analysis.\(^ {141} \)

A Pilot study was conducted considering the aims and objectives from 04/04/13 to 31/07/13. This was done to assess the feasibility of the study and to decide on a plan for a statistical analysis. Prior administrative permission was obtained from the higher
authority. The study was conducted on 20 health personnel and 80 parents from urban and rural areas of Pune city. The pilot study was conducted in Rajgurunagar and Bhosari area. Data was collected through the Self-structured Interview Schedule. The skill was assessed by observation checklist. The data was analyzed with the help of a descriptive and inferential statistics. The unpaired t-test is used to compare data between urban and rural population. Pilot study indicates that tool is feasible and practicable.

3.16 Procedure for data collection

A formal permission is obtained from authorities. First the official permission was taken from District Health Officer of Pune District then the permission also taken from medical officer, Nagarsevak and Sarpanch of those respective areas. Actual data collection was done for 800 parents of under five child & 200 health personnel meeting the criteria for the study.

The following schedule was followed for data collection: The investigator approached the subjects, informed them regarding the objectives of the study and obtained the consent after assuring the subjects about the confidentiality of the data. Structure interview technique and observation checklist was used for data collection.

3.17 Plan for data analysis

The data analysis was planned to include descriptive and inferential statistics. The following plan of analysis was made with the opinion of experts. The analysis will be done based on the objectives to be tested.

Items related to the background variables would be analyzed in terms of frequency and percentages.

- Frequency distributions would be plotted to compare the practices of urban and rural population.
- Mean, Standard deviation of checklist of practices would be computed.
- “Z” test would be applied to determine the significance of mean difference between urban and rural population based on practices.
- The significance was calculated by using mean, standard deviation and calculated ‘P’ value. Chi-square was used to find the co-relation with every item & the findings were documented in tables, graphs & diagrams.

Summary:

This chapter has explicitly described the sequence in which the investigator had carried out the research. It described the research approach, setting of the study, sample sampling method, development of research tool, validity, reliability, pilot study, method of data collection and plan for data analysis adopted for the present study. The findings of the pilot study guided the investigator for data collection and feasibility of study.